REMARKS

This Amendment is filed in response to the first Office Action dated May 17, 2005, which has a shortened statutory period set to expire August 17, 2005.

Claims 1, 4, 6-10, 13-14, 22-23, 25, 27-31, 34-35, 43, 45-46, and 48 Are Patentable Over U.S. Patent 6,802,045 (Sonderman)

Applicant respectfully traverses the rejection of these claims as being anticipated by Sonderman.

Sonderman teaches a method of implementing a control simulation environment into a manufacturing environment. Col. 2, lines 10-12. Specifically, in the system taught by Sonderman, the manufacturing model 140 contains a manufacturing recipe that determines a plurality of control input parameters that can be sent to processing tools 120a, 120b via machine interfaces 115a, 115b, respectively. Col. 4, lines 15-17, 20-25. The semiconductor wafers 105 that are processed by processing tools 120a, 120b can also be sent to a metrology tool 150 for acquisition of metrology data. Col. 4, lines 31-34. The metrology data analyzer unit 160 can organize, analyze, and correlate the metrology data. Col. 4, lines 41-44. The manufacturing environment 170, i.e. metrology data analysis unit 160, can send these metrology data results to the simulation environment 210. Col. 5, lines 1-2. The simulation environment 210 can then use the metrology data results and perform various tests and calculations to provide more accurate, modified control parameters to the process control environment 180. Col. 5, lines 2-6. A feedback loop is then completed when the process control environment 180 sends the modified or adjusted process control parameters to the manufacturing environment 170 for further processing of semiconductor wafers. Col. 5, lines 6-10.

As evident from the above teachings, Sonderman teaches using simulation to improve the <u>subsequent processing of the semiconductor wafers</u>. In contrast, Applicant teaches a method of <u>analyzing a mask</u> for use in photolithography and specifically <u>using distributed computation resources to output printability results for the defects on the mask</u>.

Specifically, Claim 1 recites:

> A method of analyzing a mask for use in photolithography, the method comprising:
> loading a mask file into a defect analysis tool;
> specifying a job to be run using the mask file, wherein the job defines parameters used in processes performed uniformly for defects on the mask;
> managing and distributing the job to computation resources;
> running the job using the mask file and defined parameters on the computation resources;
> outputting results of the job from the computation resources, wherein the results include printability results for the defects on the mask.

Similarly, Claim 23 recites:

> A system for analyzing a mask for use in photolithography, the system comprising:
> an application server for running a defect analysis tool;
> means for loading a mask file into the defect analysis tool;
> means for specifying a job to be run using the mask file, wherein the job defines parameters used in processes performed uniformly for defects on the mask;
> computation resources for running the job;
> a job manager for distributing the job to the computation resources and receiving results of the job from the computation resources; and
> means for outputting results of the job, wherein the results include printability results for the defects on the mask.

(SN: 10/618,816)

Similarly, Claim 43 recites:

A computer program product comprising:

    a computer usable medium having a computer readable program code embodied there for causing a computer to analyze defects of a mask used in photolithography, the computer readable program code comprising:

    code that loads a mask file into a defect analysis tool;

    code that specifies a job to be run using the mask file, wherein the job defines parameters used in processes performed uniformly for defects on the mask;

    code that manages and distributes the job to computation resources;

    code that runs the job using the mask file and defined parameters on the computation resources; and

    code that outputs results of the job, wherein the results include printability results for the defects on the mask.

The Office Action cites Figs. 1-9 of Sonderman as teaching a method/system/computer program product for analyzing a mask for use in photolithography. Applicant respectfully traverses this characterization. None of these figures teaches analyzing a mask. The Office Action provides no support for rejecting any of the steps recited in Claims 1, 23, and 43, except for the limitation regarding outputting results. The Office Action cites Fig. 5 as teaching this limitation. Applicant respectfully also traverses this characterization. Fig. 5 teaches a flowchart for performing a process simulation function. Col. 6, lines 48-50. This figure teaches nothing about outputting printability results for defects on the mask. Therefore, because Sonderman fails to disclose any of the limitations recited in Claims 1, 23, and 43, Applicant requests reconsideration and withdrawal of the rejection of Claims 1, 23, and 43.

Claims 4, 6-10, 13-14, and 22 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Claims 25, 27-31, and 34-35 depend from Claim 23 and therefore are patentable for at least the reasons presented for Claim 23. Claims 45-46 and 48 depend from Claim 43 and therefore are patentable for at least the reasons presented for Claim 43. Based on the above dependencies, Applicant requests reconsideration and withdrawal of the rejection of Claims 4, 6-10, 13-14, 22, 25, 27-31, 34-35, 45-46, and 48.

Moreover, Claim 6 recites in part, "wherein the parameters include settings relating to an inspection system that provided information for the mask file". The Office Action cites col. 7, lines 54-65 as teaching these limitations. Applicant respectfully traverses this characterization. Col. 7, lines 54-65 teach that simulation results are sent to process control environment 180 via process control interface 350 so that process control environment 180 can utilize the simulation data to better control the processing of the semiconductor wafers. Because col. 7, lines 54-65 fail to disclose the limitations of Claim 6, Applicant requests reconsideration and withdrawal of the rejection of Claim 6.

Moreover, Claim 7 recites in part, "wherein the settings include at least one of an inspection system vendor and an inspection system model". The Office Action cites Fig. 1 and col. 4, lines 18-63 (manufacturing model) as teaching these limitations. Applicant respectfully traverses this characterization. Col. 4, lines 18-63 teach the general use of the system shown in Fig. 1. Nothing in this passage indicates that manufacturing model 140 can generate settings relating to an inspection system, much less settings including an inspection system vendor or an inspection system model. Therefore,

Applicant requests reconsideration and withdrawal of the rejection of Claim 7.

Moreover, Claim 10 recites in part, "wherein managing and distributing the job is performed by a job manager". Applicant notes that "the job" is run using the mask file and results of "the job" include printability results for the defects on the mask (see Claim 1). The Office Action cites Fig. 1 as teaching the limitations of Claim 10. Fig. 1 does teach process tools 120a and 120b. However, nothing in Sonderman teaches that the process either one performs is run with a mask file or outputs printability results for defects on a mask. Logically, if Sonderman does not teach the recited job, then Sonderman also cannot teach managing and distributing the job using a job manager. Because Sonderman fails to disclose the limitations of Claim 10, Applicants request further reconsideration and withdrawal of the rejection of Claim 10.

Moreover, Claim 14 recites in part, "wherein one level includes an overall summary of simulations performed on the defects". The Office Action cites system 100 (Fig. 1) and col. 6 as teaching these limitations. Applicant respectfully traverses this characterization. Applicant notes that the "the defects" recited in Claim 14 refer to defects on the mask (see Claim 1). Sonderman fails to disclose any simulations performed on the mask defects. Therefore, Applicant requests reconsideration and withdrawal of the rejection of Claim 14.

Moreover, Claim 27 recites in part, "wherein the means for specifying the job includes means for defining parameters for settings relating to an inspection system that provided information for the mask file". The Office Action cites col. 7, lines 54-65 as teaching these limitations. Applicant respectfully traverses this characterization. Col. 7, lines 54-65 teach that the simulation results are sent to process control

environment 180 via process control interface 350 so that process control environment 180 can utilize the simulation data to better control the processing of the semiconductor wafers. Because col. 7, lines 54-65 fail to disclose the limitations of Claim 27, Applicant requests reconsideration and withdrawal of the rejection of Claim 27.

Moreover, Claim 28 recites in part, "wherein the settings include at least one of an inspection system vendor and an inspection system model". The Office Action cites Fig. 1 and col. 4, lines 18-63 (manufacturing model) as teaching these limitations. Applicant respectfully traverses this characterization. Col. 4, lines 18-63 teach the general use of the system shown in Fig. 1. Nothing in this passage indicates that manufacturing model 140 can generate settings relating to an inspection system, much less settings including an inspection system vendor or an inspection system model. Therefore, Applicant requests reconsideration and withdrawal of the rejection of Claim 28.

Moreover, Claim 35 recites in part, "wherein at least one review level includes an overall summary of simulations performed on the defects". The Office Action cites system 100 (Fig. 1) and col. 6 as teaching these limitations. Applicant respectfully traverses this characterization. Applicant notes that the "the defects" recited in Claim 35 refer to defects on the mask (see Claim 23). Sonderman fails to disclose any simulations performed on the mask defects. Therefore, Applicant requests reconsideration and withdrawal of the rejection of Claim 35.

Moreover Claim 46 recites in part, "wherein the code that manages and distributes the job includes a job manager". Applicant notes that "the job" is run using the mask file and results of "the job" include printability results for the

defects on the mask (see Claim 43). The Office Action cites
Fig. 1 as teaching the limitations of Claim 46. Fig. 1 does
teach process tools 120a and 120b. However, nothing in
Sonderman teaches that the process either one performs is run
with a mask file or outputs printability results for defects on
a mask. Logically, if Sonderman does not teach the recited job,
then Sonderman also cannot teach managing and distributing the
job using a job manager. Because Sonderman fails to disclose
the limitations of Claim 46, Applicants request further
reconsideration and withdrawal of the rejection of Claim 46.

## Claims 2-5, 19, 24-26, 39, 41-42, And 44-45 Are Patentable Over Sonderman In View Of Avant!Or Sematch

Claims 2-5 and 19 depend from Claim 1 and therefore are
patentable for at least the reasons presented for Claim 1.
Claims 24-26, 39, and 41-42 depend from Claim 23 and therefore
are patentable for at least the reasons presented for Claim 23.
Claims 44-45 depend from Claim 43 and therefore are patentable
for at least the reasons presented for Claim 43.

Applicant notes that Avant! and Sematech fail to remedy the
deficiency of Sonderman with respect to Claims 1, 23, and 43.
Therefore, the combination of Sonderman and Avant!, or
alternatively Sonderman and Sematech must also logically fail to
disclose the dependent Claims 2-5, 19, 24-26, 39, 41-42, and 44-
45.

Based on the above reasons, Applicant requests
reconsideration and withdrawal of the rejection of Claims 2-5,
19, 24-26, 39, 41-42, and 44-45.

## Claims 11-12, 20-21, 32-33, 40, 47, And 49 Are Patentable Over Sonderman

Claims 11-12 and 20-21 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Claims 32-33 and 40 depend from Claim 23 and therefore are patentable for at least the reasons presented for Claim 23. Claims 47 and 49 depend from Claim 43 and therefore are patentable for at least the reasons presented for Claim 43. Based on the above reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 11-12, 20-21, 32-33, 40, 47, and 49.

Moreover, Claim 11 recites in part, "wherein the job manager allows multiple jobs to be run in parallel", Claim 12 recites in part, "wherein the job manager schedules multiple computation resources to run one or more jobs", Claim 32 recites in part, "wherein the job manager includes means for allowing multiple jobs to be run in parallel", Claim 33 recites in part, "wherein the job manager includes means for scheduling multiple computation resources to run one or more jobs", and Claim 47 recites in part, "wherein the job manager allows multiple jobs to be run in parallel". Applicant notes that "jobs" are run using the mask file (see Claims 1, 23, and 43). The Office Action cites Fig. 1 as teaching the limitations of Claims 11, 12, 32, 33, and 47. Fig. 1 does teach process tools 120a and 120b. However, nothing in Sonderman teaches that the process either one performs is run with a mask file. Logically, if Sonderman does not teach the recited jobs, then Sonderman also cannot teach allowing multiple jobs to be run in parallel or scheduling multiple computation resources to run one or more jobs. Because Sonderman fails to disclose the limitations of Claims 11, 12, 32, 33, and 47, Applicants request further reconsideration and withdrawal of the rejection of Claims 11, 12, 32, 33, and 47.

Moreover, Claim 20 recites in part, "entering a status for

each defect based on a user's review of the results of the job",
Claim 21 recites in part, "providing a history of statuses for
each defect based on users' reviews of the results of the job",
Claim 40 recites in part, "means for entering a status for each
defect based on a user's review of the results of the job; and
means for providing a history of statuses for each defect based
on users' reviews of the results of the job", and Claim 49
recites in part, "code that enters a status for each defect
based on a user's review of the results of the job; and code
that provides a history of statuses for each defect based on
users' reviews of the results of the job". The Office Action
cites Figs. 1-2 and col. 3, line 37 to col. 4, line 47.
Notably, nothing in this passage or set of figures teaches
providing a status of a mask defect or a history of that mask
defect based on the simulation results generated by simulation
environment 210. Therefore, Applicant requests further
reconsideration and withdrawal of the rejection of Claims 20,
21, 40, and 49.


Claim 15 Is Patentable Over Sonderman In View Of U.S. Patent
Publication 2004/0133369 (Pack) Or U.S. Patent Publication
2003/0161525 (Bruce)

Claim 15 depends from Claim 1 and therefore is patentable
for at least the reasons presented for Claim 1. Applicant notes
that Pack teaches a method and system for context-specific mask
inspection. Similarly, Bruce teaches a mask defect analysis
system. Of importance, any mask inspection and mask defect
analysis would be performed before using the manufacturing
environment taught by Sonderman is used. Thus, the references
cannot be combined as indicated in the Office Action. Based on
those reasons, Applicant requests reconsideration and withdrawal
of the rejection of Claim 15.

## Claims 16-18, 36-38, And 41 Are Patentable Over Sonderman In View of Potucek

Claims 16-18 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Claims 36-38 and 41 depend from Claim 23 and therefore are patentable for at least the reasons presented for Claim 23. Applicant notes that Potucek teaches an image processing system for a document. Col. 1, lines 62-63. It is unclear to Applicant how the wafer manufacturing environment of Sonderman can be combined with the document scanner of Potucek. Specifically, Applicant respectfully submits that these references relate to completely different areas of technology, in which case there can be no suggestion to combine these references. Based on the above reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 16-18, 36-38, and 41.

## CONCLUSION

Claims 1-49 are pending in the present application. Allowance of these claims is respectfully requested.

If there are any questions, please telephone the undersigned at 408-451-5907 to expedite prosecution of this case.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 29, 2005.

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